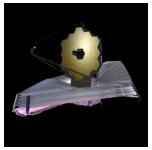

3768 - A global view of a massive cluster in formation with JWST

Cycle: 2, Proposal Category: GO

INVESTIGATORS

Name	*Institution*
Dr. Morten Andersen (PI) (ESA Member)	**European Southern Observatory - Germany**
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OBSERVATIONS

Folder	*Observation*	*Label*	*Observing Template*	*Science Target*
G286 obs				
	11	NIRCAM 1 field	NIRCam Imaging	(3) G286

ABSTRACT

Understanding the formation of massive star clusters is a crucial topic of current astrophysics, since most stars and planetary systems are born in such systems. We propose to observe the massive, forming star cluster G286.21+0.17, which is feasible to map in its entirety with JWST-NIRCam in a modest amount of observing time. With its unique sensitivity, spatial resolution and wavelength coverage, including water band filters that trace the effective temperature of low mass objects, we will be able to accurately characterise the individual young stellar objects (YSOs) and discriminate between background objects and cluster members down to a mass limit of 20 Jupiter masses. Accretion and outflow activity will be assessed from narrowband filters. Access to 3.5 and 4.8 microns allows us to determine the fraction of objects with a circumstellar disk and compare this with the same ratio for low-mass regions to determine the effects of environment on the disks and hence the consequences for planet formation. The observation will also build upon archival, multi-epoch HST/WFC3-IR imaging that now spans a 10-year baseline to make unique astrometric measurements of the kinematics of young stellar objects (YSOs) in the region. A new JWST measurement will allow determination of global infall or

expansion of the cluster population, measure motions of sub-groups, and individual higher velocity members. A NIR variability analysis will also be extended to cover this time baseline, including of very low-mass objects, some of which are known to be outbursting. In this way, an unique global view of massive star cluster formation will be unveiled.

OBSERVING DESCRIPTION

This is a simple NIRCam program to image a 2*1 mosaic of a massive star forming molecular clump in order to characterise the stellar and brown dwarf content. Three filters will be used in each of the SW and LW arms for a total of 6 filters observed. There will be used to derive effective temperatures of the cluster content, determine the fraction of objects with circumstellar disks and to determine the spatial distribution of sources within the clump.

There are no requirements on additional calibration besides what is already planned as part of the NIRCam characterisation.

We further request parallel NIRISS observations. There is no constraint on the rotation angle for these observations that will be used to trace the general stellar population in the direction of G286.

Fixed Targets

#	Name	Target Coordinates	Targ. Coord. Corrections	Miscellaneous
(3)	G286	RA: 10 38 29.5887 (159.6232863d) Dec: -58 19 4.62 (-58.31795d) Equinox: J2000		

Comments:
Category=ISM
Description=[Dense interstellar clouds, H II regions, Molecular clouds, Protostars]

Observation

Proposal 3768, Observation 11: NIRCAM 1 field Tue Feb 20 23:00:13 GMT 2024

Diagnostic Status: Warning

Observing Template: NIRCam Imaging

Coordinated Parallel Template(s): NIRISS Imaging

Diagnostics

(Visit 11:1) Warning (Form): Overheads are provisional until the Visit Planner has been run.

(Visit 11:2) Warning (Form): Data Excess over lower threshold

(Visit 11:2) Warning (Form): Overheads are provisional until the Visit Planner has been run.

Fixed Targets

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Template

NIRCam Imaging	NIRISS Imaging
Module: ALL	
Subarray: FULL	
Target Placement: Module Gap	

Mosaic

Rows	Columns	Row Overlap %	Column Overlap %	Row shift (deg)	Column shift (deg)	Tile Order
2	1	10.0	10.0	0.0	0.0	DEFAULT

Dithers

#	Primary Dither Type	Primary Dithers	Dither Size	Subpixel Positions	Coordinated Parallel Subpixel Selector	Dither Direct Images Primes
1	FULLBOX	6TIGHT		1	NIRCam Only	NO_DITHERING

Spectral Elements

NIRCam Imaging	Short Filter	Long Filter	Readout Pattern	Groups/Int	Integrations/Exp	Total Integrations	Total Dithers	Total Exposure Time	ETC Wkbk.Calc ID
1	F162M+F150W2	F405N+F444W	SHALLOW2	6	1	6	6	1739.357	146810
2	F182M	F470N+F444W	SHALLOW2	6	1	6	6	1739.357	146810
3	F115W	F410M	SHALLOW2	6	1	6	6	1739.357	146810
4	F200W	F356W	SHALLOW2	4	1	6	6	1095.151	146810

Spectral Elements

NIRISS Imaging	Filter	Grism	Readout Pattern	Groups/Int	Integrations/Exp	Total Dithers	Total Integrations	Total Exposure Time	ETC Wkbk.Calc ID
1	F115W		NIS	6	1	6	6	1610.516	
2	F150W		NIS	6	1	6	6	1610.516	
3	F200W		NIS	6	1	6	6	1610.516	
4	F356W		NISRAPID	16	1	6	6	1095.151	

Special Requirements	
	Group Visits within 53.0 Days Aperture PA Range 55 to 90 Degrees (V3 55.0713531 to 90.0713531) Visits Same PA No Parallel Attachments